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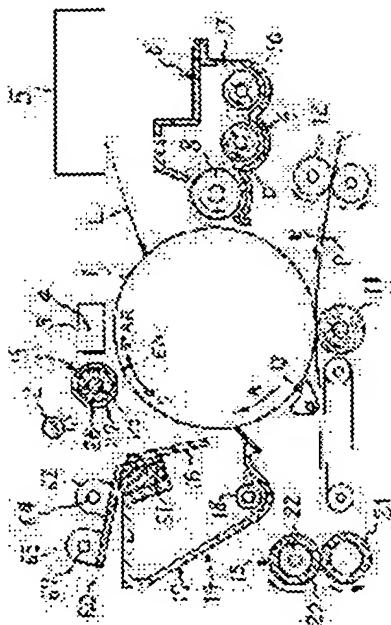
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## (54) IMAGE FORMING METHOD AND DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To prolong the life of an image carrier and to prevent an abnormal image caused by discharge product stuck to the surface of the image carrier in an image forming device where an electrostatic latent image formed on the image carrier is developed as a toner image by a developing device and the toner image is transferred to transfer material.

SOLUTION: Toner left after transfer which is stuck to the surface of the image carrier without being transferred to the transfer material P is removed by the developing device 6, and a product removing member 19 abutting on the surface of the image carrier 1 is provided and supported to be separated from the surface of the image carrier 1.



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CLAIMS

[Claim(s)]

[Claim 1] In the image formation approach which forms an electrostatic latent image in the electrified image support, forms this electrostatic latent image into a visible image as a toner image with a developer, and imprints this toner image to imprint material While constituting so that said developer may remove the transfer residual toner adhering to the image support front face which passed through the imprint location where the imprint of a toner image is performed The discharge product which the product removal member was contacted on the image support front face, and adhered to this front face is removed. The image formation approach characterized by separating this product removal member from an image support front face when the image support surface part from which the transfer residual toner is not removed by said developer passes along said product removal member.

[Claim 2] The image formation approach according to claim 1 of separating the product removal member from the image support front face when the power source of image formation equipment is turned off.

[Claim 3] The image formation approach according to claim 1 or 2 of contacting the cleaning member arranged so that it may contact or separate on an image support front face on an image support front face, and this cleaning member cleaning this image support front face, and contacting said product removal member into the cleaned image support surface part.

[Claim 4] The image formation approach according to claim 1 to 3 of contacting said product removal member into the image support surface part concerned which impressed the bias of the time of formation of a toner image, and reversed polarity to this development electrode, and passed the developer when the image support surface part which said product removal member should contact passed the development electrode of the developer with which development bias is impressed at the time of formation of a toner image.

[Claim 5] Image support, the electrification equipment charged in this image support, and the latent-image means forming which forms an electrostatic latent image in the electrified image support, In the image formation equipment possessing the developer which forms this electrostatic latent image into a visible image as a toner image, and the imprint equipment which imprints this toner image to imprint material While constituting so that said developer may remove the transfer residual toner adhering to the image support front face which passed through the imprint location where the imprint of a toner image is performed Image formation equipment characterized by contacting an image support front face and providing the product removal member which removes the discharge product adhering to this front face.

[Claim 6] Image formation equipment possessing a removal member attachment-and-detachment means to operate a product removal member so that said product removal member may contact or separate on an image support front face according to claim 5.

[Claim 7] Said removal member attachment-and-detachment means is image formation equipment according to claim 6 constituted so that this product removal member may be separated from the image support front face when the image support surface part from which the transfer residual toner is not removed by said developer passes along said product removal member.

[Claim 8] When, as for said removal member attachment-and-detachment means, image formation actuation which one image formation actuation or multiple times follows is performed, The formation field back end of the toner image formed in the image support front face of image formation actuation of the last passes through said imprint location. And image formation equipment according to claim 7 constituted so that said product removal member may be

contacted into the image support surface part of the direction upstream of image support surface migration rather than this toner image formation field back end after passing said product removal member.

[Claim 9] Said removal member attachment-and-detachment means is image formation equipment according to claim 7 or 8 constituted so that said product removal member may be contacted to the formation field of one toner image on image support, and the staging area which is a staging area between the formation fields of the next toner image of the direction upstream of image support surface migration, and by which the transfer residual toner is removed from this with the developer, when image formation actuation which multiple times follow is performed.

[Claim 10] Said removal member attachment-and-detachment means is image formation equipment according to claim 7 to 9 constituted so that said product removal member may be contacted on the image support front face on which it moves at the time of the warm up of image formation equipment.

[Claim 11] Said removal member attachment-and-detachment means is image formation equipment according to claim 7 to 10 constituted so that said product removal member may be contacted on the image support front face on which it moves, before image formation actuation is performed.

[Claim 12] Said removal member attachment-and-detachment means is image formation equipment according to claim 6 to 11 constituted so that the product removal member concerned may be contacted on an image support front face while the front face of this image support takes at least 1 round, when a product removal member contacts an image support front face.

[Claim 13] Said removal member attachment-and-detachment means is image formation equipment according to claim 6 to 12 constituted so that the product removal member may be made to estrange from an image support front face when the power source of image formation equipment is turned off.

[Claim 14] So that an image support front face may be contacted and the cleaning member which cleans this front face, and this cleaning member may contact or separate on an image support front face A cleaning member attachment-and-detachment means to operate this cleaning member is provided. This cleaning member It is the upstream from the location where said product removal member contacts an image support front face about the direction of image support surface migration. It is arranged so that the image support surface part of the downstream may be contacted rather than said imprint location. Said cleaning member attachment-and-detachment means So that said product removal member may contact the image support surface part cleaned by said cleaning member Image formation equipment according to claim 6 to 13 constituted so that said cleaning member may be contacted on an image support front face in front rather than this product removal member contacts an image support front face.

[Claim 15] Said cleaning member attachment-and-detachment means is image formation equipment according to claim 14 constituted so that a cleaning member may be contacted into the image support surface part from which the transfer residual toner was removed by said developer.

[Claim 16] Said product removal member is image formation equipment according to claim 5 to 15 constituted so that the water solution of a discharge product may be sucked up and a discharge product may be removed, while supplying water to a discharge product.

[Claim 17] Said product removal member is image formation equipment according to claim 5 to 16 which has the high absorptivity member in contact with an image support front face, and the water member containing the water supplied to this high absorptivity member.

[Claim 18] Said product removal member is image formation equipment according to claim 5 to 16 which consists of the member currently held after the high absorptivity matter has swollen with water in the hole of porosity material.

[Claim 19] Said product removal member is image formation equipment according to claim 5 to 15 which consists of the member which supported the polar adsorbent which adsorbs a discharge product.

[Claim 20] Said product removal member is image formation equipment according to claim 19 with which it has the elastic body which supported the polar adsorbent, and this elastic body contacts an image support front face.

[Claim 21] Said product removal member is image formation equipment according to claim 19 with which it has an elastic body and the surface attached in this elastic body, said polar adsorbent is supported by this surface, and the surface concerned contacts an image support front face.

[Claim 22] Said product removal member is image formation equipment according to claim 19 with which it has the brush which consists of the fiber which supported the polar adsorbent, and this brush contacts an image support front face.

[Claim 23] Said product removal member is image formation equipment according to claim 16 to 22 constituted in the

shape of [ which is almost wound around two or more supporter material, and contacts an image support front face ] an endless belt.

[Claim 24] Said product removal member is image formation equipment according to claim 16 to 22 currently formed in the shape of [ which can be rolled round ] a sheet.

[Claim 25] Said polar adsorbent is image formation equipment according to claim 19 to 24 which consists of at least one of a zeolite, a silica-alumina system adsorbent, silica gel, alumina gel, an activated alumina, and activated clay.

[Claim 26] Said polar adsorbent is image formation equipment according to claim 19 to 24 whose oxygen ring of the molecular structure of this zeolite it consists of a zeolite and is six or more membered-rings.

[Claim 27] Said product removal member is image formation equipment according to claim 5 to 26 arranged rather than the development location in which a toner image is formed by said developer so that it may be the upstream and the image support surface part of the downstream may be contacted rather than said imprint location about the direction of image support surface migration.

[Claim 28] When the image support surface part which said developer has the development electrode with which development bias is impressed at the time of formation of a toner image, and said product removal member should contact passes said development electrode, Image formation equipment according to claim 6 to 27 with which said product removal member contacts the image support surface part concerned which the bias of the time of formation of a toner image and reversed polarity was impressed to this development electrode, and passed the developer.

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**DETAILED DESCRIPTION**

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention forms an electrostatic latent image in the electrified image support, forms this electrostatic latent image into a visible image as a toner image with a developer, and relates to the image formation approach which imprints this toner image to imprint material, and its equipment.

[0002]

[Description of the Prior Art] The image formation approach of the above-mentioned format adopted as the compound machine equipped with a copying machine, facsimile, printers, or these at least two functions etc. and its equipment are common knowledge from the former. In this kind generally used conventionally of image formation equipment, the cleaning member which removes the transfer residual toner adhering to the image support front face which passed through the imprint location where the imprint of a toner image is performed was prepared, and the transfer residual toner which this cleaning member was made to contact an image support front face, and adhered to the image support front face is removed. However, although an image support front face is [ every / \*\*\* small quantity ] when this cleaning member is used, it is shaved off by the cleaning member and the front face concerned is worn out. The more there is much this abrasion loss, the life of image support contracts and, the more these must be exchanged at an early stage.

[0003] What is necessary is just to constitute the transfer residual toner adhering to an image support front face so that not a cleaning member but a developer may remove in order to remove an above-mentioned fault and to develop the life of image support. According to this image formation equipment, since a cleaning member does not contact an image support front face, the abrasion loss of the front face can be reduced effectively, and it becomes possible to develop the life of image support greatly. This method is also called the cleaner loess method.

[0004] However, when it constitutes so that an image support front face may not be deleted by the cleaning member, a lot of discharge products adhere to an image support front face, and there is a possibility that an abnormality image may be generated on image support by this. That is, the equipment accompanied by discharge is formed in the surroundings of image support at the time of actuation like electrification equipment, nitrogen oxides are generated by the discharge, this combines with the matter in air, a nitric-acid compound is generated, and this adheres to an image support front face as a discharge product. This discharge product absorbs the moisture in air at the time of highly humid, resistance of an image support front face is reduced, and an abnormality image is generated on image support by this.

[0005] If the cleaning member which contacts an image support front face constitutes so that image support may be shaved off comparatively so much with a discharge product, it will not generate, but if the above-mentioned fault is constituted so that a cleaning member may not be made to contact an image support front face in order to develop the life of image support as mentioned above, by the cleaning member, it will become impossible to remove the discharge product adhering to an image support front face, and an above-mentioned abnormality image will generate it. Thus, in order to develop the life of image support, it is effective to constitute so that a cleaning member may not be made to contact an image support front face, but if constituted in this way, a lot of discharge products will adhere to an image support front face, and the fault which an abnormality image generates will not be escaped.

[0006]

[Problem(s) to be Solved by the Invention] This invention sets it as the 1st purpose to offer the image formation

approach that generating of the abnormality image which originates in a discharge product can be prevented, and sets it as the 2nd purpose to offer the image formation equipment while it is made based on the new recognition mentioned above and can develop the life of image support.

[0007]

[Means for Solving the Problem] In the image formation approach which forms an electrostatic latent image in the electrified image support, forms this electrostatic latent image into a visible image as a toner image with a developer, and imprints this toner image to imprint material in order that this invention may attain the 1st purpose of the above. While constituting so that said developer may remove the transfer residual toner adhering to the image support front face which passed through the imprint location where the imprint of a toner image is performed. The discharge product which the product removal member was contacted on the image support front face, and adhered to this front face is removed. When the image support surface part from which the transfer residual toner is not removed by said developer passes along said product removal member, the image formation approach characterized by separating this product removal member from an image support front face is proposed (claim 1).

[0008] When the power source of image formation equipment is turned off in that case, it is advantageous, if it constitutes so that the product removal member may be separated from the image support front face (claim 2).

[0009] Moreover, it is advantageous, if it constitutes so that the cleaning member arranged so that it may contact or separate on an image support front face in above-mentioned claim 1 or the image formation approach given in 2 is contacted on an image support front face, this cleaning member may clean this image support front face and said product removal member may be contacted into the cleaned image support surface part (claim 3).

[0010] Furthermore, it sets to the image formation approach given in above-mentioned claim 1 thru/or either of 3. When the image support surface part which said product removal member should contact passes the development electrode of the developer with which development bias is impressed at the time of formation of a toner image, It is advantageous, if it constitutes so that said product removal member may be contacted into the image support surface part concerned which impressed the bias of the time of formation of a toner image, and reversed polarity to this development electrode, and passed the developer (claim 4).

[0011] Moreover, the electrification equipment charged in image support and this image support in order that this invention may attain the 2nd purpose of the above, In the image formation equipment possessing the latent-image means forming which forms an electrostatic latent image in the electrified image support, the developer which forms this electrostatic latent image into a visible image as a toner image, and the imprint equipment which imprints this toner image to imprint material. While constituting so that said developer may remove the transfer residual toner adhering to the image support front face which passed through the imprint location where the imprint of a toner image is performed. An image support front face is contacted and the image formation equipment characterized by providing the product removal member which removes the discharge product adhering to this front face is proposed (claim 5).

[0012] In that case, if a removal member attachment-and-detachment means to operate a product removal member is provided so that said product removal member may contact or separate on an image support front face, it is advantageous (claim 6).

[0013] Moreover, in image formation equipment given in above-mentioned claim 6, when the image support surface part from which the transfer residual toner is not removed by said developer passes along said product removal member, if said removal member attachment-and-detachment means is constituted so that this product removal member may be separated from the image support front face, it is advantageous (claim 7).

[0014] In image formation equipment given in above-mentioned claim 7 furthermore, said removal member attachment-and-detachment means When image formation actuation which one image formation actuation or multiple times follows is performed, The formation field back end of the toner image formed in the image support front face of image formation actuation of the last passes through said imprint location. And after passing said product removal member, it is advantageous, if it is constituted so that said product removal member may be contacted into the image support surface part of the direction upstream of image support surface migration rather than this toner image formation field back end (claim 8).

[0015] In above-mentioned claim 7 or image formation equipment given in 8 moreover, said removal member attachment-and-detachment means When image formation actuation which multiple times follow is performed, the formation field of one toner image on image support, It is advantageous, if it is constituted so that said product removal member may be contacted to the staging area which is a staging area between the formation fields of the next toner

image of the direction upstream of image support surface migration and by which the transfer residual toner is removed from this with the developer (claim 9).

[0016] Furthermore, in above-mentioned claim 7 thru/or image formation equipment given in either of 9, if said removal member attachment-and-detachment means is constituted so that said product removal member may be contacted on the image support front face on which it moves at the time of the warm up of image formation equipment, it is advantageous (claim 10).

[0017] Moreover, in above-mentioned claim 7 thru/or image formation equipment given in either of 10, before image formation actuation is performed, if said removal member attachment-and-detachment means is constituted so that said product removal member may be contacted on the image support front face on which it moves, it is advantageous (claim 11).

[0018] Furthermore, in above-mentioned claim 6 thru/or image formation equipment given in either of 11, when a product removal member contacts on an image support front face, while the front face of this image support takes at least 1 round, if said removal member attachment-and-detachment means is constituted so that the product removal member concerned may be contacted on an image support front face, it is advantageous (claim 12).

[0019] Moreover, in above-mentioned claim 6 thru/or image formation equipment given in either of 12, when the power source of image formation equipment is turned off, if said removal member attachment-and-detachment means is constituted so that the product removal member may be made to estrange from an image support front face, it is advantageous (claim 13).

[0020] Furthermore, it sets to above-mentioned claim 6 thru/or image formation equipment given in either of 13. So that an image support front face may be contacted and the cleaning member which cleans this front face, and this cleaning member may contact or separate on an image support front face A cleaning member attachment-and-detachment means to operate this cleaning member is provided. This cleaning member It is the upstream from the location where said product removal member contacts an image support front face about the direction of image support surface migration. It is arranged so that the image support surface part of the downstream may be contacted rather than said imprint location. Said cleaning member attachment-and-detachment means It is advantageous, if it is constituted so that said cleaning member may be contacted on an image support front face in front rather than this product removal member contacts an image support front face so that said product removal member may contact the image support surface part cleaned by said cleaning member (claim 14).

[0021] Moreover, in image formation equipment given in above-mentioned claim 14, if said cleaning member attachment-and-detachment means is constituted so that a cleaning member may be contacted into the image support surface part from which the transfer residual toner was removed by said developer, it is advantageous (claim 15).

[0022] Furthermore, in above-mentioned claim 5 thru/or image formation equipment given in either of 15, if said product removal member is constituted so that the water solution of a discharge product may be sucked up and a discharge product may be removed, it is advantageous, while supplying water to a discharge product (claim 16).

[0023] Moreover, in above-mentioned claim 5 thru/or image formation equipment given in either of 16, if said product removal member has the high absorptivity member which contacts on an image support front face, and the water member containing the water supplied to this high absorptivity member, it is advantageous (claim 17).

[0024] Furthermore, in above-mentioned claim 5 thru/or image formation equipment given in either of 16, if said product removal member consists of the member currently held after the high absorptivity matter has swollen with water in the hole of porosity material, it is advantageous (claim 18).

[0025] Moreover, in above-mentioned claim 5 thru/or image formation equipment given in either of 15, if said product removal member consists of the member which supported the polar adsorbent which adsorbs a discharge product, it is advantageous (claim 19).

[0026] Moreover, in image formation equipment given in above-mentioned claim 19, if said product removal member is constituted so that it may have the elastic body which supported the polar adsorbent and this elastic body may contact an image support front face, it is advantageous (claim 20).

[0027] Furthermore, in image formation equipment given in above-mentioned claim 19, if said product removal member is constituted so that it may have an elastic body and the surface attached at this elastic body, said polar adsorbent may be supported by this surface and the surface concerned may contact an image support front face, it is advantageous (claim 21).

[0028] Moreover, in image formation equipment given in above-mentioned claim 19, if said product removal member

is constituted so that it may have the brush which consists of the fiber which supported the polar adsorbent and this brush may contact an image support front face, it is advantageous (claim 22).

[0029] Furthermore, in above-mentioned claim 16 thru/or image formation equipment given in either of 22, if said product removal member is constituted in the shape of [ which is almost wound around two or more supporter material, and contacts an image support front face ] an endless belt, it is advantageous (claim 23).

[0030] Moreover, in above-mentioned claim 16 thru/or image formation equipment given in either of 22, if said product removal member is formed in the shape of [ which can be rolled round ] a sheet, it is advantageous (claim 24).

[0031] Furthermore, in above-mentioned claim 19 thru/or image formation equipment given in either of 14, if said polar adsorbent consists of at least one of a zeolite, a silica-alumina system adsorbent, silica gel, alumina gel, an activated alumina, and activated clay, it is advantageous (claim 25).

[0032] Moreover, in above-mentioned claim 19 thru/or image formation equipment given in either of 24, said polar adsorbent is advantageous in it consisting of a zeolite and the oxygen ring of the molecular structure of this zeolite being six or more membered-rings (claim 26).

[0033] Furthermore, in above-mentioned claim 5 thru/or image formation equipment given in either of 26, if the product removal member is arranged so that it may be the upstream and the image support surface part of the downstream may be contacted rather than said imprint location, it is more advantageous than the development location in which a toner image is formed by said developer about the direction of image support surface migration (claim 27).

[0034] In above-mentioned claim 6 thru/or image formation equipment given in either of 27 moreover, said developer When the image support surface part which it has the development electrode with which development bias is impressed at the time of formation of a toner image, and said product removal member should contact passes said development electrode, It is advantageous, if it is constituted so that said product removal member may contact the image support surface part concerned which the bias of the time of formation of a toner image and reversed polarity was impressed to this development electrode, and passed the developer (claim 28).

[0035]

[Embodiment of the Invention] The mechanism which explains and combines the example of an operation gestalt of this invention according to a drawing, and an abnormality image generates by the discharge product hereafter is clarified.

[0036] Drawing 1 is the partial cross-section schematic diagram showing an example of image formation equipment. The image formation equipment shown here has the image support 1 constituted as a photo conductor of the shape of a drum established in the body, and the rotation drive of the image support 1 is carried out with initiation of image formation actuation in the clockwise rotation of arrow-head A in drawing 1, i.e., the direction. At this time, the light from the electric discharge lamp 2 is irradiated by the image support front face, this image support front face receives an electric discharge operation, and that surface potential is initialized. On the other hand, an electrification electrical potential difference is impressed to the charging wire 4 of the electrification equipment 3 constituted as an electrification charger, and the initialized image support front face is uniformly charged in a predetermined polarity -900V by discharge which this produces. Thus, from the image support front face, nothing and the illustrated electrification equipment 3 estrange the business for which electrification equipment is charged in the front face of image support, and it is arranged.

[0037] It replaces with a drum-like photo conductor, and although the image support which consists of the photo conductor of the shape of a belt by which winds around two or more rollers, is imposed, and a transit drive is carried out, or the image support which consists of a dielectric can also be used, it is supported so that the front face may move image support in any case.

[0038] Laser beam L which carries out outgoing radiation from the laser write-in equipment 5 which is an example of latent-image means forming and by which light modulation was carried out is irradiated by the image support front face charged as mentioned above, and the electrostatic latent image corresponding to a picture signal is formed in an image support front face of this on it. The potential of the image support front face which has irradiated the laser beam is set to -150V, this becomes an electrostatic latent image, i.e., the image section, the potential of the image support surface part by which a laser beam is not irradiated is mostly maintained by -900V, and this serves as the natural complexion section. Thus, the laser write-in unit 5 which is an example of latent-image means forming makes the business which forms an electrostatic latent image in the electrified image support front face. It has light emitting devices, such as LED, and the latent-image means forming which irradiates the light which carries out outgoing radiation from the light

emitting device in the electrification side of image support, and forms an electrostatic latent image can also be used. Although this latent-image means forming or the illustrated latent-image means forming of a format is constituted so that the electrified image support front face may be exposed and an electrostatic latent image may be formed in that front face, latent-image means forming other than this format can also be used for it.

[0039] An electrostatic latent image is formed into a visible image as a toner image, when this passes along a developer 6. The developer 6 illustrated here has a toner, the development case 7 which held the binary system developer D of the shape of fine particles which has a carrier, the developing roller 8 which opposite arrangement is carried out at the image support 1, and rotates, and the screws 9 and 10 which agitate Developer D while rotating. A toner is charged in a minus polarity in a predetermined polarity and the example of drawing by friction with a carrier, and the developer D containing this toner is supported by the peripheral surface of a developing roller 8 by magnetism, is conveyed, and is carried to the development field between a developing roller 8 and the image support 1. At this time, predetermined development bias (for example, electrical potential difference of -600V) is impressed, the toner in the developer which was carried to the development field by this and became magnetic brush-like by it shifts to the electrostatic latent image formed in the image support 1, i.e., the image section, electrostatic, and that electrostatic latent image is formed into a visible image by the developing roller 8 as a toner image. Thus, the electrostatic latent image formed in image support is formed into a visible image as a toner image by the developer 6. The developer of the one component system of the shape of fine particles which does not contain a carrier, the developer using a liquefied developer, etc. are also employable.

[0040] A developing roller 8 constitutes an example of the developer support which supports and conveys the developer with which visible image-ization of an electrostatic latent image is presented, and has the development electrode or developer support which requires a developer while it constitutes an example of the development electrode with which development bias is impressed at the time of formation of a toner image.

[0041] Moreover, the imprint roller 11 which is an example of the imprint equipment which imprints the toner image formed in the image support front face to imprint material is counterposed by the image support 1, and the rotation drive of this imprint roller 11 is carried out at the counterclockwise rotation in drawing 1, contacting an image support front face. It feeds from the feed section which is not illustrated between this imprint roller 11 and the image support 1 -- having -- a resist roller pair -- the imprint material P sent out in the direction of arrow-head B to predetermined timing by rotation of 12 passes. At this time, in the electrification polarity of the toner of the toner image on image support, reversed polarity, and this example, the imprint electrical potential difference of a plus polarity is impressed, and that toner image is imprinted by the imprint roller 11 electrostatic on the imprint material P sent out to the timing which can be adjusted in the toner image formed in the image support front face by this.

[0042] It is separated from the image support 1 by the separation pawl 13, and the imprint material P passing through between the imprint roller 11 and the image support 1 is conveyed further, and passes through between the fixing roller 20 of an anchorage device 15, and the pressurization rollers 21. At this time, the operation of a pressure received from the heat, and the fixing roller 20 and the pressurization roller 21 from the fixing roller 20 heated at the heater 22 is fixed to the imprinted toner image on imprint material, and, subsequently to outside the plane, this imprint material P is discharged. Here, as imprint material P, although paper, a resin sheet, or a resin film is used, for example, the imprint material which consists of a middle imprint object so that it may mention later can also be used. Moreover, the imprint equipment which replaced with the imprint roller 11, for example, combined an imprint charger, an imprint brush, imprint blades, or these at least one and imprint belts can also be used.

[0043] What is shown in drawing 1 with a sign 19 is later explained in detail about this, although it is the product removal member which removes the discharge product adhering to an image support front face.

[0044] About the migration direction of an image support front face, by the downstream, the image support surface part of the upstream is countered rather than the above-mentioned product removal member 19, and cleaning equipment 14 is formed rather than the imprint roller 11. Although this cleaning equipment 14 has the cleaning member 16 constituted as a cleaning blade, this cleaning member 16 is estranged from an image support front face, and it usually carries out a pressure welding to an image support front face to the timing mentioned later. Cleaning equipment 14 is not used in order to mention later, and it can also constitute image formation equipment, without forming this cleaning equipment 14. A cleaning member is prepared if needed.

[0045] The transfer residual toner adhering to the image support front face which passed through the imprint location where the imprint of a toner image is performed as mentioned above passes the cleaning member 16 which is distant

from the image support front face, and the product removal member 19 which is similarly distant from the image support front face as it is. Subsequently, with the electric discharge lamp 2, light can be irradiated, the absolute value of the potential of the image support front face is lowered, and the image support surface part to which the transfer residual toner adhered passes electrification equipment 3 successively. When the image support surface part to which the transfer residual toner adhered passes along electrification equipment 3, the image support surface part concerned is charged in a minus polarity with a transfer residual toner from on a transfer residual toner with the electrification equipment 3. Thus, laser beam L by which light modulation was again carried out to the electrified image support front face is irradiated, an electrostatic latent image is formed in an image support front face of this, the electrostatic latent image is formed into a visible image as a toner image by the developer 6, and the toner image concerned is imprinted on the imprint material P as mentioned above.

[0046] As for the transfer residual toner which adhered to the image support front face after imprinting a toner image to the imprint material P, it is common that it is in the condition that it was influenced of the electrical potential difference of a plus polarity impressed to the imprint roller 11, and was charged in plus at the time of the imprint of a toner image, or the plus polar and minus polar transfer residual toner was intermingled. This transfer residual toner is charged with electrification equipment 3, and is arranged with a minus polarity. The amount of electrifications of the toner at this time is for example, -30microc/g extent. Moreover, the average electrification potential of the image support front face charged with electrification equipment 3 becomes the value of general about [ -900V\*\*50V ] specification within the limits from on a transfer residual toner.

[0047] When the electrostatic latent image of the image support front face to which the transfer residual toner adhered, i.e., the image section, and \*\*\*\*\* pass along a developer 6, the surface potential of the natural complexion section For example, it is -900V mostly, and since the electrification polarity of the toner which moreover adhered here is arranged with minus, the toner concerned shifts to the developing-roller 8 side with which the development bias of -600V was impressed electrostatic, and the transfer residual toner adhering to the natural complexion section is removed. on the other hand -- the surface potential of the image section -- about [ for example, ] -- it is -150V, and since the electrification polarity of the toner which adhered here is also minus, the toner does not shift to a developing roller 8, but the toner of a minus polarity on a developing roller 8 shifts to the image section electrostatic conversely, and the image section, i.e., an electrostatic latent image, is formed into a visible image as a toner image.

[0048] Since the amount of a transfer residual toner is \*\*\*\* small quantity when the imprint effectiveness of a toner image with the imprint roller 11 is 90% or more, though it is generally difficult to have taken completely all the transfer residual toners on the natural complexion section with the developer 6, even if the toner has adhered to the natural complexion section of an image support front face which passed the developer 6, the amount is a \*\*\*\* minute amount and becomes the thing of extent which can be disregarded. Thus, the transfer residual toner adhering to the image support front face which passed through the imprint location where the imprint of a toner image is performed is removed by the developer 6. Since the transfer residual toner collected by the developer 6 is again used for formation of a toner image, it can lose an abandonment toner or can make this \*\*\*\* small quantity.

[0049] When the image formation actuation mentioned above carries out multiple-times continuation and is performed, one certain toner image is formed by the developer 6 on image support, and the staging area between both toner image formation fields (field between the so-called papers) passes a developer 6 until the front end of the field where a toner image should be formed next on image support results [ from the time of the back end of the toner image formation field passing a developer 6 ] in a developer 6. The transfer residual toner which adhered here with this staging area at this time, and the transfer residual toner which adhered to the staging area concerned since it was charged in minus and the laser beam moreover was not irradiated by this staging area with electrification equipment shift to a developing-roller 8 side electrostatic, and that staging area is cleaned.

[0050] After the last toner image finishes being formed by the developer 6 and the toner image formation field back end passes a developer 6, As well as [ completely ] the place mentioned above when the image support surface part (non-image field) of the direction upstream of image support surface migration passes a developer 6 here, the transfer residual toner adhering to this image support surface part, i.e., a non-image field, is cleaned by the developer 6.

[0051] In addition, the electrification equipment which may use equipments other than an electrification charger, for example, consists of an electrification roller (refer to drawing 19 ), an electrification blade, or an electrification brush as electrification equipment charged in the front face of image support can also be used. Since a transfer residual toner passes electrification equipment in that case, when electrification equipment touches the image support front face, it is

desirable to use the electrification equipment which there is a possibility that the electrification equipment may be soiled by the transfer residual toner, therefore separates from an image support front face, and is arranged.

[0052] As mentioned above, in the image formation equipment of this example, since it is constituted so that a developer 6 may remove a transfer residual toner, abrasion loss of an image support front face with time can be extremely lessened by this, and it becomes possible to develop the life of image support greatly as a pressure welding is not carried out to time amount with a long cleaning member, and an image support front face.

[0053] However, if it constitutes so that a cleaning member may not remove a transfer residual toner as explained also in advance, supposing the discharge product adhering to an image support front face will no longer be removed by the cleaning member and it will leave this discharge product, an abnormality image will come to be generated on the image support front face after development. It is based on the image formation equipment illustrating the fault relevant to these, and is explained as generating of a discharge product below.

[0054] Although a predetermined electrification electrical potential difference is impressed to that charging wire 4 and the electrification equipment 3 shown in drawing 1 electrifies an image support front face by discharge at this time, as explained also in advance, nitrogen oxides (NOx) are generated at the time of that discharge, this combines with the matter in air etc., an ammonium nitrate is generated, and this nitric-acid compound adheres to an image support front face as a discharge product. When electrification equipment consisted of the electrification charger, image formation actuation is ended and the image support 1 stops, a discharge product adheres to the image support surface part which counters an electrification charger so much. When an electrification roller, an electrification brush, or an electrification blade is used as electrification equipment, nitrogen oxides are generated similarly, and this adheres to an image support front face as a discharge product. It is also the same as when a discharge product may adhere on image support and imprint equipments other than an imprint roller are used also by discharge from the imprint roller 11 with which the imprint electrical potential difference was impressed.

[0055] Supposing it leaves the discharge product which consists of the nitric-acid compound which adhered to the image support front face as mentioned above as it is, since the discharge product is water solubility, the moisture in air will be absorbed, and it will dissolve in the water, and it will be dissociated to ion. Thus, when the discharge product on image support absorbs water, the resistance of an image support front face falls. Therefore, if this was left when this discharge product adhered so much ranging over the image section and the natural complexion section of an image support front face, the abnormality image called image dotage, image dirt, or a white omission by the toner image after development is generated, and the image quality deteriorates.

[0056] Drawing 2 and drawing 3 are drawings explaining this, the axis of abscissa of these graphs shows the location of an image support front face, and the axis of ordinate shows the potential (V) of an image support front face. When the discharge product has not adhered to an image support front face, as shown in drawing 2, the surface potential of the natural complexion section by which a laser beam is not irradiated is mostly set to -900V, and the surface potential of the image section by which the laser beam was irradiated is mostly set to -150V. The development bias impressed to a developing roller 8 is -600V. As shown in drawing 2, the toner charged in the minus polarity adheres to the direction of the image section electrostatic according to the surface potential of the natural complexion section on image support, and the image section, and the potential difference with development bias, without adhering to the natural complexion section.

[0057] On the other hand, a continuous line shows the surface potential of image support when a discharge product adheres to an image support front face ranging over the image section and the natural complexion section to drawing 3. The broken line of drawing 3 shows the condition of potential, i.e., the potential shown in drawing 2, in case a discharge product does not adhere. If a discharge product adheres to an image support front face, since the resistance of the front face will fall, like the continuous line of drawing 3, the charge of the natural complexion section flows to the direction of the image section, and the absolute value of the potential of the image section becomes high. For this reason, the difference of the surface potential of the image section and development bias becomes small, the toner image concentration of the image section after development becomes low, and an abnormality image is generated. If a discharge product adheres to an image support front face, an abnormality image will become is easy to be formed especially at the time of highly humid.

[0058] So, in the image formation equipment of this example, an image support front face is contacted and the above-mentioned product removal member 19 which removes the discharge product adhering to the front face is formed, and it is constituted so that the abnormality image which originates in a discharge product by this can prevent the fault

formed in an image support front face. While attaining reuse of a toner, and the reinforcement of image support by constituting so that a developer may remove a transfer residual toner, the fault produced when this configuration is adopted is avoided by the product removal member 19.

[0059] Although the product removal member 19 can be constituted from various modes and this product removal member 19 may moreover always be contacted on the image support front face, any product removal member 19 of a gestalt explained below is supported so that the location in contact with an image support front face and the location distant from that front face can be occupied with a removal member attachment-and-detachment means to illustrate later. The example of the timing which the example and the product removal member 19 of a removal member attachment-and-detachment means are contacted on an image support front face, or detaches this is made to explain later, and clarifies the example of a concrete configuration of the product removal member 19 first.

[0060] Drawing 1 shows the condition that the product removal member 19 separated from the image support front face, and the product removal member 19 contacts an image support front face, as shown in drawing 4, and drawing 4 shows the condition that the product removal member 19 contacted the image support front face, and removes the discharge product adhering to the front face. Drawing 5 is drawing of longitudinal section of the product removal member 19 shown in drawing 4. The product removal member 19 shown here consists of a shaft 25 which consists of high rigidity ingredients, such as a metal or rigid resin, a water member 26 of the shape of a cylinder fixed to the outside in the shape of a said alignment, and a high absorptivity member 27 covered where the surroundings of the water member 26 are sealed. Although the shaft 25 may be fixed to immobilization to the body of image formation equipment, in this example, the product removal member 19 is supported pivotable by the base material which is not illustrated.

[0061] Although the location in which the product removal member 19 is formed can be set up suitably, in the example shown in drawing 1, about the migration direction of an image support front face, it is the upstream from electrification equipment 3, and the product removal member 19 is arranged rather than the imprint location at the downstream. Moreover, when cleaning equipment 14 is formed like the example shown in drawing 1, the product removal member 19 is formed in the direction downstream of image support surface migration rather than the cleaning member 16 of the cleaning equipment 14.

[0062] The water member 26 was not restricted to this, although having consisted of the elastic body of water nature was desirable, for example, it consisted of porous bodies, such as foam, such as polyurethane rubber, silicone rubber, ethylene propylene rubber, butadiene rubber, a styrene rubber, chloroprene rubber, butylene rubber, and an elastomer, or sponge, and urethane foam. Water is contained in the water member 26 which has this elasticity.

[0063] Moreover, the high absorptivity member 27 consists of polyacrylic acid, a polymer lane acid, polymethacrylic acid, polyacrylamide, sodium polyacrylate or these derivatives, and these copolymer polymers. Or poly alkyl oxide, such as polyethylene oxide, a polyvinyl pyrrolidone, Polyvinyl alcohol, a polyvinyl butyral, polyacrylamide, A polypropylene glycol, glue, gelatin, GAZEIN, albumin, An alginic acid, sodium alginate, methyl cellulose, a carboxymethyl cellulose, Hydroxyethyl cellulose, polyvinyl ether, polyvinyl methyl cellulose, Although a polyethylene glycol, a glucose, a xylose, a sucrose, a maltose, arabinose, alpha-cyclodextrin, starch or these copolymers, a graft polymer, a bridge formation object, etc. can constitute the high absorptivity member 27 It is not limited to these ingredients. Water is supplied to this high absorptivity member 27 from the water member 26 of the inside, it serves as gel, has adhesiveness, and maintains moderate moisture.

[0064] By the product removal member 19 constituted like \*\*\*\*, when removing the discharge product adhering to an image support front face, as shown in drawing 4, the product removal member 19 is followed and rotated to rotation of the image support 1, while the peripheral face of the high absorptivity member 27 continues and carries out a pressure welding to the image formation field full in the shaft orientations of an image support front face. At this time, since nothing and this serve as gel in the shape of a sheet which can deform almost freely and the water member 26 of that inside moreover has elasticity, the high absorptivity member 27 has a certain width of face N (drawing 4) in the hoop direction of the image support 1, and carries out the pressure welding of the product removal member 19 to an image support front face. Instead of making rotation of the image support 1 follow, taking the product removal member 19, and carrying out a time rate, it can also constitute so that a rotation drive may be carried out with the driving gear which is not illustrating the product removal member 19 concerned.

[0065] As mentioned above, if the discharge product which consists of the nitric-acid compound which adhered to the image support front face by discharge results in the contact section of the image support 1 and the product removal

member 19 with rotation of the image support 1 With the water supplied from the water member 26, a discharge product contacts the moisture contained in the high absorptivity member 27 used as gel, the adhesion force [ as opposed to penetration and an image support front face in the discharge product ] of a discharge product can weaken in water, and this discharge product is absorbed by the high absorptivity member 27, and is held.

[0066] Although it is possible that a part of discharge product held as ion at the high absorptivity member 27 oozes out on an image support front face, and it leaves the product removal member 19 with water again if the product removal member 19 rotates one time Since a nitric-acid compound can have the very high solubility to water and it can melt into water in large quantities even if there is such a thing, the discharge product which left the product removal member 19 It is again incorporated and held at the high absorptivity member 27 together with the discharge product which newly adhered to the image support front face. Thus, the fault which the abnormality image which the discharge product has not adhered to the image support front face which passed the product removal member 19 even if it made the image support front face always carry out the pressure welding of the cleaning member and did not shave off the front face so much substantially, or the amount decreases extremely, and originate in a discharge product at the time of highly humid generates can be prevented. By charging the image support front face after removing a discharge product even to extent which is not abnormality image student \*\* with electrification equipment, the surface potential of the image support after electrification can become uniform, moreover predetermined potential required for formation of an electrostatic latent image can be secured, and the quality image can be formed by this.

[0067] The product removal member 19 is formed in the shape of a roller, and although the effectiveness which removes the discharge product of an image support front face can be raised if it constitutes so that this may be rotated, a product removal member can also be formed in other gestalten. For example, the water member which has elasticity is formed in the shape of a cube, a sheet-like high absorptivity member is attached in the at least one field, a product removal member is constituted, and you may make it make an image support front face carry out the pressure welding of the high absorptivity member.

[0068] It has the high absorptivity member which contacts an image support front face, and a water member containing the water supplied to the high absorptivity member, and these members are attached in one, and a high absorptivity member contacts an image support front face, and the above-mentioned product removal member is constituted so that the discharge product adhering to the front face may be removed.

[0069] On the other hand, as shown in drawing 6, the cylinder-like porosity material 29 which has elasticity can be fixed to the shaft 32 which consists of the rigid body, and the product removal member 19 of the shape of a roller which holds and changes in the condition of having made the hole 31 of the porosity material swelling the high absorptivity matter 30 with water can also be used. For example, while it is applied to it as the fine-particles-like high absorptivity matter is sprinkled on the front face of the porosity material 29, and filling up the hole 31 of the porosity material 29 with the high absorptivity matter, the high absorptivity matter is made to swell with water, and the high absorptivity matter 30 is made to hold to the hole 31 of the porosity material 29 in the condition of having made it swelling.

[0070] If shown more concretely, the hole 31 of the porosity material 29 has an about 0.5mm diameter, and after the high absorptivity matter 30 of the shape of particle size (0.1 micrometers thru/or about 0.5 micrometers) of powder has swollen with water in this hole 31, it is held. Although the high absorptivity matter 30 is held only at many holes 31 exposed to the front face of the porosity material 29, the high absorptivity matter 30 may be filled up also into the hole inside the porosity material 29 with the example shown in drawing 6. moreover, the hole exposed to the front face of the porosity material 29 -- even if the high absorptivity matter has adhered, it does not need to adhere to peripheral face parts 33 other than 31. Thus, the front face of the near product removal member 19 where the high absorptivity matter 30 was held is contacted on an image support front face at the time of removal of a discharge product.

[0071] Although the porosity material 29 may be hydrophobicity or you may be a hydrophilic property, the porosity material 29 of this example is constituted by the spring material which has a hydrophilic property. When the porosity material 29 had elasticity and this contacts an image support front face, the fault which attaches a blemish to the front face can be prevented.

[0072] Also as for the product removal member 19 shown in drawing 6, it is desirable to support pivotable to the base material which is not illustrated, to make rotation of the image support 1 follow, and to rotate the product removal member 19, or to carry out a rotation drive with a driving gear. The same ingredient as the above-mentioned water member 26 can constitute the porosity material 29, and it can also constitute the high absorptivity matter 30 with the

same ingredient as the above-mentioned high absorptivity member 27.

[0073] If the discharge product which consists of the nitric-acid compound which adhered to the image support front face by discharge results in the entrance side of the pressure-welding section with the product removal member 19 shown in the image support 1 and drawing 6 with rotation of the image support 1, from an image support front face, the discharge product will be transferred to the high absorptivity matter 30 swollen with water, and will be held in the high absorptivity matter 30. Although it absorbs and swells a lot of moisture, the high absorptivity matter 30 does not dissolve in water, and moreover, carry out the so-called breathing which, and absorbs or is carried out according to the humidity of the thrust to an image support front face, or an ambient atmosphere, it is made to dissolve with the water which breathed out the water-soluble discharge product, and it serves to suck up the water solution of the discharge product. [breathing out water] A discharge product is incorporated and held at the high absorptivity matter 30.

[0074] Moreover, it is again incorporated by the high absorptivity matter 30 together with the discharge product which newly adhered to the image support front face since solubility [as opposed to / although it is possible that a part of discharge product held as ion also in this case at the high absorptivity matter 30 oozes out on an image support front face in water again, and the product removal member 19 is left, even if such / sometimes / water in a nitric-acid compound] was very high, and is held. Thus, to the image support front face which passed the product removal member 19, the discharge product has not adhered substantially, or the amount decreases extremely on it, and the fault which the image dotage which originates in a discharge product at the time of highly humid generates can be prevented on it.

[0075] Moreover, since the porosity material 29 shown in drawing 6 is a hydrophilic property, the function in which the high absorptivity matter 30 and the porosity material 29 of the same hydrophilic property become easy to adhere mutually, and hold the high absorptivity matter 30 to the hole 31 of the porosity material 29 is raised. The holdout of the high absorptivity matter 30 to the porosity material 29 can be raised. Furthermore, the front face of the image support which consists of a photo conductor is hydrophobicity, and since the porosity material 29 and the high absorptivity matter 30 which carried out the pressure welding to this are a hydrophilic property, will become weak and the high absorptivity matter 30 stops being able to shift to an image support front face easily, and both adhesion force can continue at a long period of time, and can hold the high absorptivity matter 30 to the porosity material 29.

[0076] Moreover, since the discharge product will be mostly absorbed to the high absorptivity matter 30 at coincidence if water is supplied to the discharge product in which the product removal member 19 adhered to the image support front face when the product removal member 19 shown in drawing 6 was used, the fault from which the property of the image support front face after discharge product removal becomes uneven can also be prevented.

[0077] As mentioned above, the product removal member 19 shown in drawing 6 can also form this product removal member 19 in proper gestalten other than the shape of a roller, although the high absorptivity matter changes from the member held in the condition of having swollen with water to the hole of porosity material.

[0078] As mentioned above, the product removal member 19 shown in drawing 4 thru/or drawing 6 is constituted so that the water solution of a discharge product may be sucked up and a discharge product may be removed, while supplying water to a discharge product.

[0079] Although there are two, the approach of roughly dividing and not making a discharge product adhering to an image support front face, and the method of removing the discharge product which once adhered to the image support front face, in the approach of removing the discharge product produced by discharge, with the image formation equipment of this example, the latter approach is adopted as mentioned above. The same is said of the product removal member mentioned later.

[0080] Moreover, the member which supports the polar adsorbent which adsorbs the discharge product which adhered the product removal member to the image support front face, and contacts an image support front face can also constitute. Drawing 7 is the same sectional view as drawing 4 showing the example, and drawing 8 is drawing of longitudinal section of the product removal member 19 shown in drawing 7.

[0081] In addition, although what was shown in drawing 7 and drawing 9, drawing 11, drawing 12, and drawing 13 with the sign 43 is the hopper which held polar adsorbent 50A, it explains these later.

[0082] The product removal member 19 shown in drawing 7 and drawing 8 consists of the shaft 35 which consists of the rigid bodies, such as a metal, and the elastic body 36 of the shape of a cylinder fixed to the outside in the shape of a said alignment, and longitudinal direction each edge of a shaft 35 is supported by the base material which is not illustrated. As shown in drawing 7 at the time of removal actuation of the discharge product which the polar adsorbent

was supported at least at the front-face side, and adhered to the image support front face of the elastic body 36 of this product removal member 19, the peripheral face of the elastic body 36 of the product removal member 19 contacts the front face of the image support 1. A polar adsorbent adheres to an image support front face, and will be in a polar-molecule condition, or the discharge product which melted into water and was ionized is adsorbed electrostatic, and the business which removes the discharge product from an image support front face is made. This polar adsorbent fixes to the elastic body 36 of the product removal member 19, and is supported with the example shown in drawing 7 and drawing 8.

[0083] As a polar adsorbent, although a zeolite, a silica-alumina system adsorbent, silica gel, alumina gel, an activated alumina, the activated clay, etc. can be used, it is desirable to use especially a zeolite.

[0084] The operation which removes the discharge product which adhered to the image support front face hereafter using the polar adsorbent constituted with the zeolite is explained.

[0085] Generally the cation of a water molecule and convertibility is contained in the big cavity of the condensation anion in which a zeolite crystal has the three-dimension skeleton structure of an aluminosilicate. Various structures are taken with the class and number of cations. Therefore, as a property of a zeolite, the molecular sieve operation (molecular sieve operation) by the cavity of the cyclic structure by the oxygen in a crystal and a reversible ion-exchange operation are shown (ion-exchange operation), and the operation which carries out adsorption separation of the matter which has a dipole, a quadrupole, and an unsaturated bond, corresponding to the configuration and dimension of a molecule by a molecular sieve operation or operation of a cation, the strong matter of polarizability, etc. further is shown (adsorption separation operation). Moreover, the matter can move in the inside of the electronic potential energy place in the cavity which constitutes a crystal (diffusion in a cavity). 3A mold zeolite (about 3A diameter of a cavity) at present with the smallest diameter of a cavity in a crystal also has a desiccation operation by adsorbing moisture etc. -- \*\*\*\* (desiccation operation) -- it sticks to ammonia, hydrogen, a methanol, etc. Since the molecular sieve (trade name) which is one sort of a zeolite has a cation in the crystal, strong compatibility is shown rather than an activated alumina or silica gel to the polar molecule by electrostatic attraction with this cation (ion compatibility operation). Furthermore, the catalysis which triggers various kinds of chemical reactions is also shown (catalysis).

[0086] The discharge product which is the causative agent of image flow is effectively removable by making adsorbent support, such as paper, cloth, felt, plastics, and rubber, support a zeolite with the above general engine performance, making this into gestalten, such as the shape of the shape of the shape of a sheet, and a roller, tabular, and a stick, and making an image support front face contact.

[0087] Although it is unknown that it is detailed about the reason a zeolite takes effect to removal of the causative agent of image flow, it thinks as follows.

[0088] The ammonium nitrate which absorbed moisture is ionizing the moisture in air (this ionization causes low resistance-ization of an image support front face, and serves as image generating flow). If the zeolite supported by the ammonium nitrate ionized with moisture at adsorbent support contacts, the nitrate ion which the ammonium cation stuck to the zeolite by an ion-exchange operation of a zeolite, an adsorption separation operation, diffusion in a cavity, etc., and remained will serve as a nitric acid with moisture. However, a nitric acid will be dehydrated by desiccation operation of a zeolite. It disperses in air or it is also considered that the nitric acid which the dehydrated nitric acid has the property decomposed with light or heat, finally decomposed into the nitrogen dioxide, and contained moisture is adsorbed by the support of a zeolite. Anyway, when each operation of a zeolite acts complexly by contact to a zeolite, an ammonium nitrate is removed and the discharge product which is the causative agent of image flow is removed from an image support front face.

[0089] Although it has the capacity for nonpolar adsorbents, such as activated carbon, to also absorb a molecule, this nonpolar adsorbent cannot adsorb a discharge product electrostatic, and does not fit adsorption of a discharge product. By making adsorbent support support the polar adsorbent which makes a zeolite the start, and contacting the adsorbent support on an image support front face, a discharge product can be adsorbed efficiently and the discharge product can be effectively removed from the image support front face.

[0090] A discharge product is efficiently removable from an image support front face by fixing and supporting the zeolite which has a property like \*\*\*\* to the peripheral surface of the elastic body 36 of the product removal member 19 shown in drawing 7 and drawing 8, and contacting this on an image support front face. It results in the contact section of the image support 1 and the product removal member 19, the product removal member 19 is contacted,

decomposition absorption of a discharge product is performed, and the discharge product which adhered on image support serves as the different matter or different gas from the nitric-acid compound of low resistance. Thus, since a discharge product forms an electrostatic latent image in the image support front face which removed the discharge product and forms this into a visible image as a toner image even to extent which does not have a bad influence on the image quality of a toner image, it can prevent that dotage occurs in the toner image, and a quality image can be obtained. Also when it constitutes that the reinforcement of the image support 1 should be attained so that the abrasion loss of the front face may decrease, the quality toner image without an abnormality image can be formed on image support. And since it is not necessary to use water for removal of a discharge product, the fault from which the property of the image support front face after discharge product removal becomes uneven can also be prevented.

[0091] As shown in drawing 7 and drawing 8, when the product removal member 19 has the elastic body 36 which supports a polar adsorbent and contacts an image support front face, the elastic body 36 Since the hoop direction can be contacted with a certain width of face N1 to the image support front face where it moves in the direction of arrow-head A, the product removal member 19 contacts an image support front face in a large area uniformly, and becomes possible [ removing the discharge product adhering to an image support front face to homogeneity ]. An elastic body 36 is constituted by elasticity spring materials, such as rubber, elasticity resin, and its foam, for example, foaming polyurethane etc.

[0092] Moreover, as shown in drawing 9, a surface 37 can be further twisted around the peripheral face of the elastic body 36 of the product removal member shown in drawing 7 and drawing 8, it can fix to it, and the polar adsorbent which changes from a zeolite to the front face of the surface 37 can be fixed and supported, and it can also constitute so that the front face of the surface 37 concerned may be contacted on an image support front face at the time of removal of a discharge product. As a surface 37, proper web materials, such as rubber, paper, cloth, and a resin sheet, can be used, and a polar adsorbent fixes on the front face, and is supported. Drawing 10 is the expansion explanatory view showing signs that the zeolite 50 crystallized for the cellulose fiber 38 of the paper has fixed using paper as a surface 37.

[0093] As mentioned above, if it constitutes so that it has the surface 37 to which the product removal member 19 is attached in an elastic body 36 and its elastic body 36, and contacts an image support front face, and a polar adsorbent may fix on the surface 37 and may be supported When the surface 37 which supported the polar adsorbent besides [ which is done so by the product removal member 19 shown in drawing 7 and drawing 8 ] effectiveness deteriorates, The surface 37 can be removed from an elastic body 36, and this can be again used as a product removal member 19 only by twisting around the elastic body 36 which was using the new surface 37 till then. It can continue at a long period of time, a shaft 32 and an elastic body 36 can be used repeatedly, and the amount of trash can be reduced.

[0094] Moreover, using the product removal member 19 which has the brush 39 which consists of the fiber of a large number with which the polar adsorbent which consists of a zeolite fixed and was supported, as shown in drawing 11, it can also constitute so that the brush 39 may be contacted on the front face of the image support 1 at the time of removal of a discharge product. The fiber of each brush 39 can be made to fix the crystallized zeolite like the place shown in drawing 10. Thus, if a brush 39 is made to contact an image support front face, the frictional force which acts on the brush 39 and an image support front face can be reduced, and the load to image support can be mitigated. For this reason, while being able to reduce the power which rotation of the image support 1 takes, it can prevent that rotation unevenness occurs in image support, and the fault which \*\*\*\*-like concentration unevenness generates in the toner image on image support can be prevented.

[0095] Moreover, as shown in drawing 12, the product removal member 19 can be formed in the shape of [ which was almost wound around the supporter material which consists of two or more rollers 40 ] an endless belt, and a polar adsorbent can be fixed and supported on the front face of the product removal member 19 of the shape of the endless belt, and it can also constitute so that the front face of this product removal member 19 may contact the front face of the image support 1 at the time of removal of a discharge product. If such a product removal member 19 is used, since the product removal member 19 will contact homogeneity on an image support front face and the touch area of the product removal member 19 and an image support front face will be expanded, the discharge product of an image support front face can be further removed on homogeneity and an effectiveness target.

[0096] Although each product removal member 19 explained above is also fixable to rotation impossible, if constituted as body of revolution which rotates these product removal members 19 while contacting an image support front face, the perimeter of the product removal member can be contacted on an image support front face, it can use, and it will

become possible to develop the life. Although the product removal member 19 may be rotated in which direction in that case, if the product removal member 19 constitutes so that it may rotate in the contact section of the product removal member 19 and image support 1 to the sense which moves in the same direction as the migration direction of an image support front face, since an image support front face and the product removal member 19 will contact smoothly, the life of the product removal member 19 can be developed.

[0097] If it constitutes so that the product removal member 19 may be supported in that case so that the product removal member 19 can rotate freely, the product removal member 19 may follow to migration of an image support front face where the front face of the image support 1 is contacted, and it may rotate in the direction of an arrow head. While being able to omit the driving gear of the product removal member 19 and being able to reduce the cost of image formation equipment, the frictional force which acts between the product removal member 19 and an image support front face can be reduced more, and the life of the product removal member 19 can be developed further.

[0098] Moreover, as shown in drawing 13, the product removal member 19 is formed in the shape of a sheet. Polar adsorbents, such as a zeolite, are fixed and supported on the front face of the product removal member 19 of the shape of the sheet. The front face of the product removal member 19 of the shape of a sheet which let out this product removal member 19 to the feed roller 41 from winding and its feed roller 41 is contacted on the front face of the image support 1. It can also constitute so that the product removal member 19 after removing a discharge product may be rolled round and it may roll round on a roller 42. Thus, if the product removal member 19 is formed in the shape of [ which can be rolled round ] a sheet, since the product removal member 19 of the shape of a sheet soiled with the toner can be rolled round on the rolling-up roller 42 concerned by carrying out the rotation drive of the rolling-up roller 42, the discharge product removal function of the product removal member 19 can always be kept high.

[0099] Moreover, while a product removal member supplies water to a discharge product with reference to drawing 4 thru/or drawing 6 The high absorptivity member to which it is constituted so that the water solution of a discharge product may be sucked up and a discharge product may be removed, and the product removal member concerned contacts an image support front face especially. Although the image formation equipment which consists of the member currently held after the high absorptivity matter has swollen [ the product removal member ] with water in the hole of porosity material by having a water member containing the water supplied to this high absorptivity member was explained As shown in drawing 12 and drawing 13, the discharge product of this configuration can be formed in the shape of a belt, or can also be formed in the shape of [ which can be rolled round ] a sheet.

[0100] Although the polar adsorbent was fixed to the product removal member and the product removal member was made to support the polar adsorbent with the example explained above, a product removal member can be made to be able to support the particle of a polar adsorbent, and the polar adsorbent which became powdered especially, and it can also constitute so that the polar adsorbent may be made to adhere on image support. For example, optimum dose [ every ] polarity adsorbent 50A is supplied on the product removal member 19 from a hopper 43, holding powder-like polar adsorbent 50A in the hopper 43 formed above the product removal member 19, and moving the product removal member 19 in the direction of an arrow head, as shown in drawing 7 , drawing 9 , drawing 11 , drawing 12 , and drawing 13 . It can rotate supporting a polar powder-like adsorbent and contacting an image support front face at the time of removal of the discharge product adhering to an image support front face, and the product removal member 19 can apply the polar adsorbent to the front face of the image support 1, and, thereby, can remove the discharge product of an image support front face.

[0101] Or the pressure welding of the adsorbent block (not shown) which formed the polar adsorbent massive can be carried out to the product removal member 19, the product removal member 19 can be rotated at the time of removal actuation of a discharge product, a polar adsorbent can be shaved [ block / the / adsorbent ], and the shaved-off polar powder-like adsorbent can be supported to the product removal member 19, and it can also constitute so that it may apply to an image support front face.

[0102] According to the above-mentioned configuration, since a polar powder-like adsorbent is supplied to an image support front face, the discharge product adhering to the image support front face is efficiently removable. Moreover, in this configuration, since it is not necessary to fix a polar adsorbent on the front face of the product removal member 19, when fixing to a product removal member uses a difficult polar adsorbent, these configurations can be adopted advantageously. Of course, a polar adsorbent can be fixed to the product removal member 19, and it can also constitute so that the product removal member 19 may be made to support a polar powder-like adsorbent.

[0103] As mentioned above, as a polar adsorbent which adsorbs a discharge product, although at least one of a zeolite,

a silica-alumina system adsorbent, silica gel, alumina gel, an activated alumina, and activated clay can be used, especially a zeolite can adsorb a discharge product electrostatic in the cavity, and can heighten the removal effectiveness. Since the diameter of an inlet port of the cavity is large, it can make a discharge product adsorb effectively that six or more membered-rings of the oxygen ring concerned are especially eight or more membered-rings, although eight kinds, 3, 4, 5, 6, 8, 10, 12, and 18, exist and any zeolite of an oxygen ring can be used for the oxygen ring of the molecular structure of a zeolite.

[0104] Although the equipment which has the water spreading roller which contacts an image support front face as equipment from which the discharge product adhering to an image support front face is removed, and the roller for water removal from which the water applied to the image support front face with that spreading roller is removed is well-known, since this equipment needs two rollers, it does not escape the fault in which the configuration of equipment is complicated and that cost goes up. On the other hand, each above-mentioned product removal member 19 can remove the discharge product on image support only by one member, and can simplify the configuration, and can reduce the cost.

[0105] By the way, wear of the product removal member 19 is promoted by the frictional force which the product removal member 19 receives [ that each product removal member 19 explained above has always carried out the pressure welding to the image support front face, and ] from an image support front face, and the lives of the product removal member 19 are shorter \*\*\*\*. Then, so that the product removal member 19 may contact or separate on an image support front face in the image formation equipment of this example A removal member attachment-and-detachment means to operate the product removal member 19 is established. The time amount to which the product removal member 19 is made to contact an image support front face, and the product removal member 19 contacts an image support front face only at a predetermined stage is shortened, and abrasion loss of this product removal member 19 is lessened, and it is constituted so that the promotion of degradation can be prevented. Although this removal member attachment-and-detachment means can be constituted suitably, the example is explained below with reference to drawing 14. The product removal member 19 shown in drawing 4 and drawing 5 is shown in drawing 14 as an example of a product removal member.

[0106] Longitudinal direction each edge of the shaft 25 of the product removal member 19 is supported by bearing 53 free [ rotation ], and each of that bearing 53 is supported movable in the direction approached or isolated to the front face of the image support 1 (drawing 1) to the base material which consists of each movable side plate 150,152, and is pressurized towards the image support front face by compression spring 54. In the sign F in drawing 14, the near side of the body of image formation equipment and Sign R show the back side of the body of image formation equipment, respectively.

[0107] The driving shaft 51 was fixed to the end face side of each movable side plate 150,152, and the swinging arm 49 has fixed in the edge by the side of the back of this driving shaft 51. A driving shaft 51 is supported by the side plate by the side of the back of the body of image formation equipment which is not illustrated, and the side plate of a near side free [ rotation ], the side plate by the side of the back is located between the movable side plate 150 and a swinging arm 49, and the side plate of a near side is further located in a near side rather than the movable side plate 152. a pin 47 is fixed to a swinging arm 49, and the end side of a connecting linkage 46 attaches in this pin 47 free [ relative rotation ] -- having -- the other end side of this connecting linkage 46 -- the plunger of a solenoid 45 -- relativity -- it is connected pivotable. Moreover, the end of tension spring 48 is stopped by the swinging arm 49, and the other end of this spring 48 is stopped by the side plate by the side of the back of the body of image formation equipment.

[0108] If a solenoid 45 operates with the active signal you are made to produce to predetermined timing, while the plunger will be lengthened in the arrow-head A1 direction and a driving shaft 51 will rotate to the circumference of the medial-axis line by this, the product removal member 19 rotates in the direction of arrow-head C around the medial-axis line of a driving shaft 51. Thereby, as shown in drawing 4, the pressure welding of the product removal member 19 is carried out to the front face of the image support 1. The discharge product which adhered to the image support front face by this is removable. Conversely, if a solenoid 45 cancels actuation, compression spring 48 will lengthen a swinging arm 49 in the direction of arrow-head E, it will rotate to the place and hard flow which the driving shaft 51 mentioned above by this, and the product removal member 19 will rotate in the arrow-head C1 direction around the medial-axis line of a driving shaft 51, and the product removal member 19 will separate from an image support front face, as shown in drawing 1.

[0109] It is also possible to be able to set up suitably the stage to make the product removal member 19 contact an

image support front face, to make the product removal member 19 contact on an image support front face during image formation actuation, and to remove a discharge product. However, in the image formation equipment of this example, supposing the product removal member 19 is in contact with the image support front face when the transfer residual toner before being removed by the developer 6 passes along the product removal member 19 since it is constituted so that a developer 6 may remove the transfer residual toner on image support, a lot of transfer residual toners will adhere to the product removal member 19. Thus, if the product removal member 19 is soiled with a toner, the discharge product removal function of this product removal member 19 will fall. For this reason, when the transfer residual toner adhering to an image support front face passes the product removal member 19, it is desirable to constitute so that the product removal member 19 may contact the image support front face to which it separates from an image support front face as that product removal member showed drawing 1, and a transfer residual toner has not adhered. That is, when the image support surface part from which the transfer residual toner is not removed by the developer 6 passes along the product removal member 19, a removal member attachment-and-detachment means is constituted so that the product removal member 19 may be separated from the image support front face.

[0110] By this configuration, since it can prevent that a lot of transfer residual toners adhere to the product removal member 19, it prevents that the discharge product removal function of the product removal member 19 falls at an early stage, and the reinforcement can be attained.

[0111] The timing which makes the product removal member 19 contact the image support front face to which a transfer residual toner has not adhered can also be suitably set up in that case. For example, when image formation actuation which one image formation actuation or multiple times follows is performed, The formation field back end of the toner image formed in the image support front face of image formation actuation of the last passes through said imprint location. And after passing said product removal member 19, a removal member attachment-and-detachment means can be constituted so that the product removal member 19 which was separated from image support till then may be contacted into the image support surface part of the direction upstream of image support surface migration rather than the toner image formation field back end.

[0112] If one above-mentioned image formation actuation or image formation actuation of multiple times will be called 1 time of a job, a toner image will be formed in an image support front face of image formation actuation of the last in 1 time of that job, that toner image will be imprinted at the imprint material P, but as shown in drawing 1, AR shall show the field in which this toner image was formed. And after it finishes the imprint of the toner image concerned and the back end EN of the toner image formation field AR passes the product removal member 19, the product removal member 19 is contacted into the image support surface part S of the direction upstream of image support surface migration rather than the back end EN. The field of this image support surface part S is a field after being cleaned by the developer 6, and the transfer residual toner has not adhered here. If the product removal member 19 is made to contact such an image support surface part S, it can prevent that a lot of toners adhere to the product removal member 19. While the product removal member 19 had been made to contact an image support front face, thus, by rotating the image support 1 once [ at least ] Since the perimeter can be covered, the discharge product adhering to an image support front face can be removed and a discharge product is moreover removed with termination of each job, before a discharge product adheres to an image support front face firmly, a discharge product can be removed, and the removal effectiveness can be heightened. Therefore, when the following job is performed, it becomes possible to prevent certainly generating of the abnormality image which originates in a discharge product.

[0113] The timing which makes the product removal member 19 contact the above-mentioned image support surface part S may be before a rotation halt of the image support accompanying termination of a job, and ends 1 time of a job, and after the image support 1 suspends rotation, it rotates image support again and you may make it make the product removal member 19 once contact the image support surface part S.

[0114] When image formation actuation which it replaces with the above-mentioned configuration, or multiple times follow with this configuration is performed, It is a staging area between the formation fields of the next toner image of the direction upstream of image support surface migration from the formation field of one toner image on image support, and this. A removal member attachment-and-detachment means can also be constituted so that said product removal member may be contacted to the staging area from which the transfer residual toner is removed by the developer. As mentioned above, since the transfer residual toner on this staging area is also removed by the developer 6 and this staging area is cleaned, it can prevent that a lot of transfer residual toners adhere to the product removal member 19 by making the product removal member 19 contact here, and removing a discharge product. To all staging

areas, it is desirable to make it make the product removal member 19 contact, and if it does in this way, a discharge product is effectively removable from an image support front face.

[0115] Moreover, it can replace with each configuration mentioned above, or the next configuration can also be adopted with the configuration.

[0116] Time amount until that fixing roller 20 starts from the condition that time amount or a fixing roller 20 was standing by at temperature lower than fixing temperature before starting from the time of power-source ON of image formation equipment to the fixing temperature to which the fixing roller 20 of the anchorage device 15 shown in drawing 1 fitted fixing of a toner image to fixing temperature is called warm-up time, and image formation actuation does not have a line crack at the time of this warm up. A removal member attachment-and-detachment means is constituted so that the image support 1 may be rotated and the product removal member 19 may contact the image support front face on which it moves at the time of the warm up of this image formation equipment. It is desirable to make the product removal member 19 contact image support also in this case, and to carry out at least one revolution of image support 1.

[0117] Since the transfer residual toner has not adhered to the image support front face which passes along the product removal member 19 at the time of a warm up, it can prevent that make the product removal member 19 contact this front face, and remove a discharge product and a lot of transfer residual toners adhere to the product removal member 19. Also by this configuration, the fall of the discharge product removal function of the product removal member 19 which originates in the dirt of a toner can be prevented, and the reinforcement can be attained. And from the first, at the time of the warm up to which image formation actuation is not performed, since the product removal member 19 is made to contact an image support front face and a discharge product is removed, the time amount of dedication for removal of a discharge product becomes unnecessary, and the latency time for discharge product removal can be abolished.

[0118] Moreover, a removal member attachment-and-detachment means can also be constituted while replacing with the configuration mentioned above or adopting each of that configuration before image formation actuation is performed, for example, so that the product removal member 19 estranged from the image support front face till then may be contacted on an image support front face and a discharge product may be removed on the image support front face on which it moves at the stage after the print key was pressed. While image support takes at least 1 round also in this case, it is desirable to make the product removal member 19 contact an image support front face, and to separate that product removal member 19 from an image support front face subsequently. Since the discharge product which adhered to the image support front face just before image formation actuation initiation is removable according to this configuration, a quality image without an abnormality image can be formed more certainly.

[0119] When the product removal member 19 contacts an image support front face in a removal member attachment-and-detachment means so that each example mentioned above may show, If it constitutes so that it may continue contacting the product removal member 19 on an image support front face and the product removal member 19 may subsequently be separated from an image support front face while the front face of the image support 1 takes at least 1 round The perimeter of the image support 1 can be covered, a discharge product can be removed, and generating of an abnormality image can be more effectively prevented by this.

[0120] The abnormality image by the discharge product only performed one image formation actuation. Do not necessarily generate suddenly, for example, the image support 1 is rotated with the surface linear velocity of 200 mm/sec. When only electric discharge and electrification of the front face are performed and the count and image support equivalent to \*\*\*\* for the imprint material of 4000 sheets are rotated, it is checked that a lot of discharge products on image support adhere to extent in which an abnormality image appears notably, and it will be in the condition that an abnormality image is generated.

[0121] Therefore, if the product removal member 19 is contacted to the staging area of an image support front face each time and a discharge product is removed, generating of the abnormality image by the discharge product can be prevented satisfactory. Moreover, also when contacting the product removal member 19 into the image support surface part S shown in drawing 1 with one termination of a job, since the count of image formation of 1 time of a job is usually 999 times at the maximum, a discharge product is removed satisfactory and generating of an abnormality image can be prevented. Moreover, when contacting the product removal member 19 on an image support front face at the time of a warm up, and removing a discharge product, and the count of image formation actuation is over 4000 times before the time of this warm up, a possibility that an abnormality image may be generated at the time of the image

formation actuation before performing removal actuation of a discharge product is in it. Therefore, when performing removal actuation of a discharge product at the time of a warm up, it is desirable to use together, this actuation, and other actuation, for example, the actuation to which the product removal member 19 is contacted into the image support surface part S.

[0122] If said removal member attachment-and-detachment means is constituted so that the product removal member may be made to estrange from an image support front face when the power source of image formation equipment is turned off, degradation of a product removal member can be mitigated further.

[0123] By the way, the cleaning equipment 14 counteracted and located in the image support 1 is formed in the image formation equipment shown in drawing 1 as mentioned above. The cleaning equipment 14 shown in drawing 1 as an example has the above-mentioned cleaning member 16 attached so that it might mention later in the cleaning case 17 and this case 17, and the toner discharge screw 18, and consists of illustrated examples as a cleaning blade to which the cleaning member 16 changes from elastic bodies, such as rubber. About the direction of image support surface migration, rather than the location where the product removal member 19 contacts an image support front face, this cleaning member 16 is arranged so that it may be the upstream and the image support surface part of the downstream may be contacted rather than an imprint location, it contacts an image support front face, removes the toner adhering to this front face, and makes the business which cleans the front face.

[0124] Moreover, it has a cleaning member attachment-and-detachment means to operate the cleaning member, and, as for drawing 15, an example of the cleaning member attachment-and-detachment means is shown so that a cleaning member may contact or leave the image formation equipment of this example on an image support front face.

Moreover, drawing 16 shows the condition that the cleaning member 16 contacted the image support front face. Before explaining the purpose of using a cleaning member attachment-and-detachment means etc., with reference to drawing 1, drawing 15, and drawing 16, the configuration of the cleaning member attachment-and-detachment means of this example is explained to be cleaning equipment 14.

[0125] As shown in drawing 1 and drawing 15, that end face side is fixed to the field of the rocking member 60, and this rocking member 60 is attached in the cleaning case 17 for the cleaning member 16 through the elastic body 61. That is, one field of an elastic body 61 is fixed to the rocking member 60 by adhesives, and the field of another side of an elastic body 61 is being fixed to the cleaning case 17 by adhesives. As shown in drawing 15, handle parts 62 and 63 are fixed to the edge by the side of [ R ] the back of an image formation equipment body of the rocking member 60, and the edge of the body near side F of image formation equipment, respectively, and these handle parts 62 and 63 are supported by the shafts 64 and 65 of the shape of a said alignment fixed to the body of image formation equipment free [ rocking ] at them. Moreover, another handle part 66 is fixed to the edge by the side of the back of the rocking member 60, and this handle part 66 is connected with the plunger 70 of a solenoid 68 through the coupling rod 67. Moreover, the end of tension spring 69 is stopped by the rocking member 60, and the other end of the spring 69 is stopped at the body side of image formation equipment.

[0126] If a solenoid 68 operates and the plunger 70 is lengthened by the upper part in drawing 15, the rocking member 60 will rotate the surroundings of shafts 64 and 65 in the arrow-head S1 direction, and as shown in drawing 1, it will estrange the cleaning member 16 from an image support front face by this.

[0127] If actuation of a solenoid 68 is canceled and the plunger 70 will be in a free condition, it will rotate to an arrow-head S 2-way according to an operation of tension spring 69, and the tip edge section of the cleaning member 16 will carry out the pressure welding of the rocking member 60 to the front face of the image support 1 by this ( drawing 16 ).

[0128] Although the transfer residual toner has not adhered when it constitutes so that the product removal member 19 may be made to contact the image support front face to which the transfer residual toner has not adhered as mentioned above here and a discharge product may be removed, usually the toner of the minute amount which did not take and go out with a developer 6 has adhered to the image support front face. Then, in the image formation equipment of this example, it is constituted so that a cleaning member may be contacted on an image support front face in front, rather than this product removal member contacts an image support front face, so that the product removal member 19 may contact the image support surface part in which the above-mentioned cleaning member attachment-and-detachment means was cleaned by the cleaning member. Make the cleaning member 16 contact an image support front face with a cleaning member attachment-and-detachment means, and carry out scraping removal of the toner which has adhered to the image support front face by that cleaning member 16, the product removal member 19 is made to contact the image support front face after that cleaning, the image support 1 is rotated in this condition, and the discharge product

adhering to an image support front face is removed. If it does in this way, the fault a toner adheres to the product removal member 19 can be prevented much more certainly, and the product removal member 19 can remove a discharge product from an image support front face more efficiently. The toner removed from image support is discharged out of a cleaning case by the toner discharge screw 18 to rotate.

[0129] If the configuration mentioned above is adopted, since the product removal member 19 will be made to contact the image support front face after being cleaned by the cleaning member It is not necessary to make the product removal member 19 not necessarily contact the image support surface part S shown in drawing 1, and the image support front face at the time of a warm up. For example, even if the cleaning member 16 removes a transfer residual toner and it makes the product removal member 19 contact on the image support front face after the removal during image formation actuation, it can prevent that a lot of toners adhere to the product removal member 19. Thus, although it is possible to make the cleaning member 16 contact an image support front face, and to make the product removal member 19 contact the image support front face cleaned by this cleaning member 16 to proper timing it is temporary -- an imitation -- the cleaning member 16 being made to contact an image support front face, and, if it constitutes so that this cleaning member 16 may remove a transfer residual toner The time amount to which the cleaning member 16 contacts an image support front face becomes long, the life of image support is shortened, there is a possibility that the amount of a waste toner may moreover increase, and the original purpose of a cleaner loess method which removes a transfer residual toner with a developer 6 may be lost.

[0130] Then, not only as for the product removal member 19 but the cleaning member 16, it is desirable to constitute the above-mentioned cleaning member attachment-and-detachment means so that the image support surface part from which the transfer residual toner was removed by the developer 6 may be contacted. If it does in this way, since the amount of the toner removed from an image support front face turns into a \*\*\*\* minute amount and the cleaning member 16 can collect and reuse almost all transfer residual toners to a developer 6, the amount of a waste toner can be decreased effectively. And since the time amount to which the cleaning member 16 contacts an image support front face is also limited, abrasion loss of the image support 1 can be lessened and the reinforcement can be attained. Moreover, since the cleaning member 16 cleans further the image support front face to which a transfer residual toner has not adhered and the product removal member 19 is made to contact the image support front face after the cleaning, it is also possible to be able to lessen extremely the toner adhering to the product removal member 19, and to completely lose this.

[0131] If shown concretely, in making the product removal member 19 contact the image support surface part S (drawing 1), as mentioned above After the back end EN of the last toner image formation field AR passes the cleaning member 16, For example, what is necessary is making the cleaning member 16 contact an image support front face, and the cleaning member's 16 cleaning the image support surface part S to which a transfer residual toner's has not adhered, and making it just make the product removal member 19 contact the cleaned image support surface part just behind that.

[0132] Moreover, also when making the product removal member 19 contact the staging area of an image support front face, the cleaning member 16 is made to contact the staging area cleaned by the developer 6 immediately after the tip of the staging area passed the cleaning member 16, and the product removal member 19 is made to contact the staging area which this cleaned.

[0133] What is necessary is just to make the product removal member 19 similarly contact the image support front face after making the cleaning member 16 contact the image support front face cleaned by the developer 6 and being cleaned by this at the time of the warm up, also when making the product removal member 19 contact an image support front face at the time of a warm up.

[0134] Although the example which makes the cleaning member 16 rock and makes the cleaning member attach and detach on an image support front face was shown in drawing 1, drawing 15, and drawing 16 As shown in drawing 17 and drawing 18, while fixing the cleaning member 16 to the cleaning case 17 While supporting the cleaning case 17 rockable on the body of image formation equipment through a shaft 71 and energizing the cleaning case 17 with tension spring 72 moreover By carrying out the pressure welding of the cam 73 to the cleaning case 17, and rotating a cam 73 The cleaning case 17 and the cleaning member 16 can be made to be able to rock around a shaft 71, as shown in drawing 17, the cleaning member 16 can be separated from an image support front face, or an image support front face can also be made to carry out the pressure welding of the cleaning member 16, as shown in drawing 18. The cleaning member attachment-and-detachment means shown in drawing 17 and drawing 18 makes the whole cleaning equipment

14 rock, and makes the cleaning member 16 attach and detach on an image support front face.

[0135] Moreover, cleaning equipments of various modes, such as the cleaning equipment which has the cleaning brush which removes a toner in contact with [ as everyone knows ] an image support front face in itself, the cleaning equipment from which support the cleaning agent of the shape of fine particles which mixes a magnetic carrier and a toner and changes on \*\*\*\*\* by magnetism, the cleaning agent is made to contact an image support front face, and a toner is removed, or cleaning equipment which uses these and a cleaning blade together, can also use. In the case of the cleaning equipment of these formats, the above-mentioned cleaning brush and a cleaning agent contact an image support front face, remove the toner adhering to this front face, and constitute the cleaning member which cleans the front face concerned.

[0136] In the image formation equipment shown in drawing 19, while being constituted by electrification roller 3A by which electrification equipment contacted the image support front face, or opened the minute gap, and was counterposed, about the migration direction of an image support front face, the product removal member 19 is the downstream from electrification equipment, and is arranged rather than the developer 6 at the upstream. The imprint electrical potential difference which superimposed the direct current on the direct current or the alternating current is impressed to electrification roller 3A. The configuration of others of the image formation equipment shown in drawing 19 does not have each above-mentioned configuration and an above-mentioned change, the sign same into a corresponding part identically to drawing 1 as drawing 1 is attached, and the duplicate explanation is omitted.

[0137] Although the product removal member 19 can be arranged in a proper location so that drawing 1 and drawing 19 may show, the product removal member 19 concerned is the upstream, and it is more desirable than the development location in which a toner image is formed by said developer about the direction of image support surface migration to be arranged rather than said imprint location, so that the image support surface part of the downstream may be contacted. Also when this constitutes so that the product removal member 19 may be contacted on an image support front face during image formation actuation, the fault a toner image is disturbed by the product removal member 19 can be prevented.

[0138] Moreover, the developing roller 8 constitutes this development electrode from an example with which have a developer and it indicated the development electrode with which development bias is impressed at the time of formation of a toner image to be to drawing 1 and drawing 19 as mentioned above. When the image support surface part which the product removal member 19 should contact passes the above-mentioned development electrode in that case, the bias of the time of formation of a toner image and reversed polarity can be impressed to the development electrode, and it can also constitute so that said product removal member may contact the image support surface part concerned which passed the developer. For example, when having passed through the location where the image support surface part S shown in drawing 1 counters the developer 6 by the side of the improvement style in the method of rotation of image support rather than the location shown in drawing 1, the bias voltage of plus is impressed to a developing roller 8. When this image support surface part S shall be charged in -900V with electrification equipment, the transfer residual toner adhering to the image support surface part S is more positively attracted electrostatic by impressing the electrical potential difference of plus to a developing roller 8 at a developing-roller 8 side. Thereby, since this image support surface part S is cleaned much more efficiently and the product removal member 19 is contacted into this surface part S, adhesion of the toner to the product removal member 19 can be prevented more certainly.

[0139] However, since there is a possibility that the carrier similarly charged in plus may adhere to an image support front face when the developer of the binary system which has a toner and a carrier is used like the developer 6 shown in drawing 1 and drawing 19, and the high electrical potential difference of a plus polarity is impressed to a developing roller 8, the value of the applied voltage to a developing roller 8 should be set up, taking this point into consideration.

[0140] Moreover, if an amorphous silicon photo conductor is used as image support, since the degree of hardness of the front face is high, the life of image support can be developed greatly, the discharge product which moreover adhered to the image support front face with the polar adsorbent can be removed, and generating of an abnormality image can be prevented.

[0141] This invention carries out image exposure of the electrified image support front face, and the part to which the absolute value of the surface potential fell is made into the natural complexion section. The image formation equipment with which the absolute value makes the part maintained highly an electrostatic latent image, makes a toner adhere here, and forms a toner image, The toner image on image support is once imprinted to the imprint material which

consists of a middle imprint object, and the toner image on the middle imprint object can be widely applied to the image formation equipment imprinted on the record medium which is final imprint material.

[0142]

[Effect of the Invention] According to each invention concerning claim 1 thru/or 28, generating of the abnormality image which originates in the discharge product which develops the life of image support and is formed in an image support front face can be prevented.

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[Translation done.]

## \* NOTICES \*

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DESCRIPTION OF DRAWINGS

### [Brief Description of the Drawings]

Drawing 1 It is the partial cross-section schematic diagram showing the whole image formation equipment configuration.

Drawing 2 It is drawing explaining the potential of an image support front face.

Drawing 3 It is drawing explaining why an abnormality image is formed in an image support front face.

Drawing 4 It is the cross-sectional view of a product removal member.

Drawing 5 It is drawing of longitudinal section of the product removal member shown in drawing 4.

Drawing 6 It is the cross-sectional view showing other examples of a product removal member.

Drawing 7 It is the cross-sectional view showing the example of further others of a product removal member.

Drawing 8 It is drawing of longitudinal section of the product removal member shown in drawing 7.

Drawing 9 It is the cross-sectional view showing still more nearly another example of a product removal member.

Drawing 10 It is the explanatory view showing the zeolite which fixed for cellulose fiber.

Drawing 11 It is the cross-sectional view showing the example of further others of a product removal member.

Drawing 12 It is drawing showing still more nearly another example of a product removal member.

Drawing 13 It is drawing showing the example of further others of a product removal member.

Drawing 14 It is the perspective view showing an example of a removal member attachment-and-detachment means.

Drawing 15 It is the perspective view showing an example of a cleaning member attachment-and-detachment means.

Drawing 16 A cleaning member is the sectional view showing the condition of having contacted the image support front face.

Drawing 17 It is drawing showing other examples of a cleaning member attachment-and-detachment means.

Drawing 18 It is drawing showing a situation when the cleaning member shown in drawing 17 contacts an image support front face.

Drawing 19 It is the partial cross-section schematic diagram showing other examples of image formation equipment.

### [Description of Notations]

1 Image Support

3 Electrification Equipment

6 Developer

16 Cleaning Member

19 Product Removal Member

26 Water Member

27 High Absorptivity Member

29 Porosity Material

30 High Absorptivity Matter

31 Hole

36 Elastic Body

37 Surface

39 Brush

50 Zeolite

50A A polar adsorbent

AR Formation field

EN Back end

P Imprint material

S Image support surface part

---

[Translation done.]

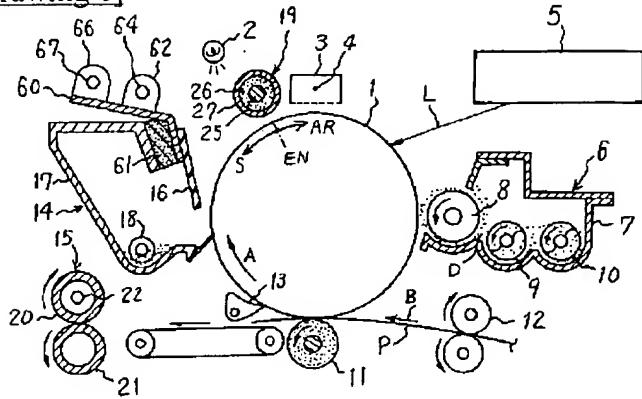
## \* NOTICES \*

JPO and NCIPPI are not responsible for any damages caused by the use of this translation.

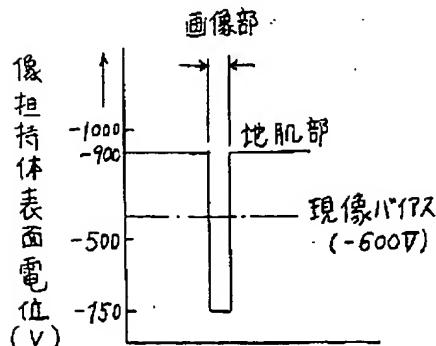
1. This document has been translated by computer. So the translation may not reflect the original precisely.
  2. \*\*\*\* shows the word which can not be translated.
  3. In the drawings, any words are not translated.

## DRAWINGS

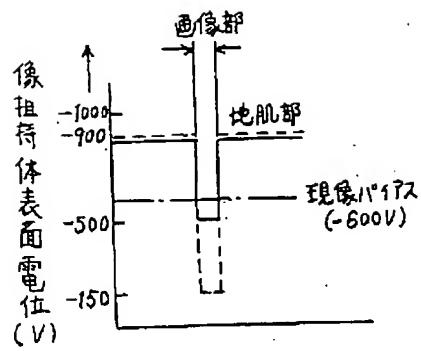
### [Drawing 1]



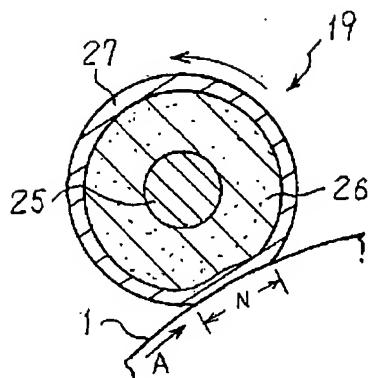
[Drawing 2]



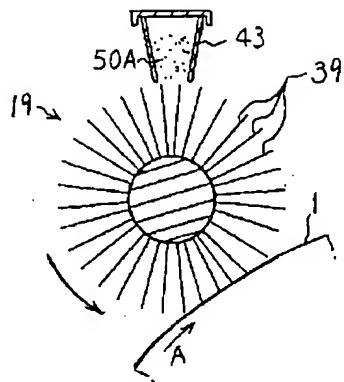
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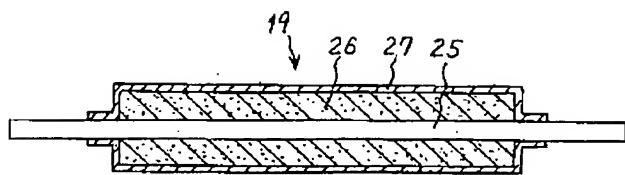
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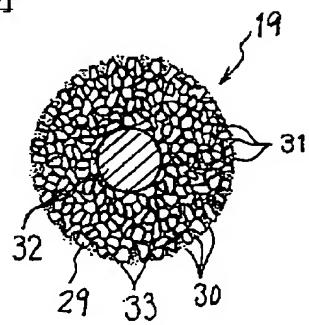
[Drawing 11]



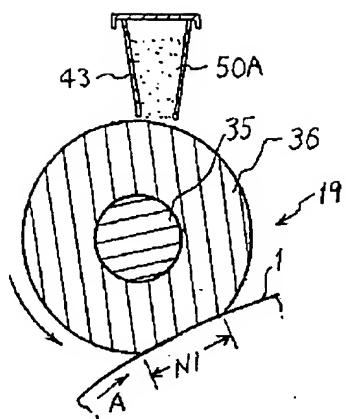
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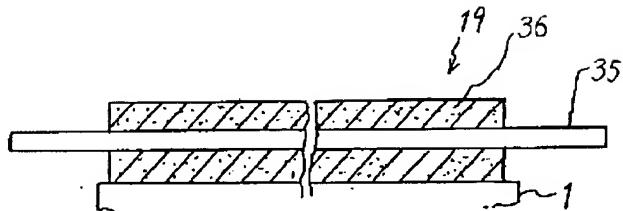
[Drawing 6]



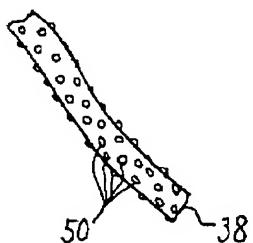
[Drawing 7]



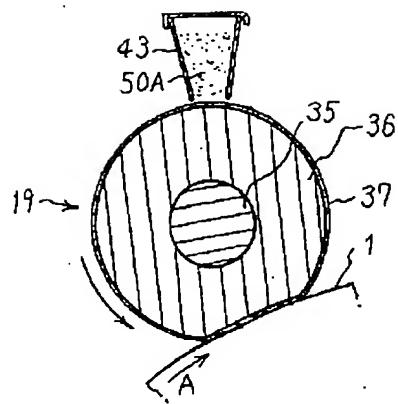
[Drawing 8]



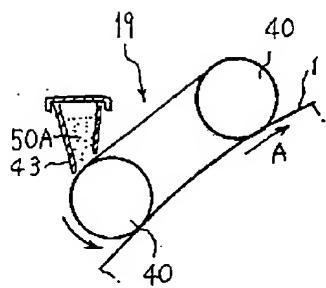
[Drawing 10]



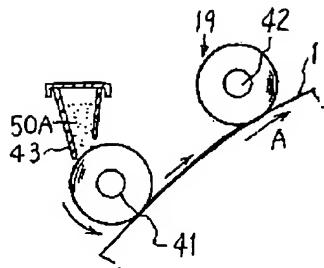
[Drawing 9]



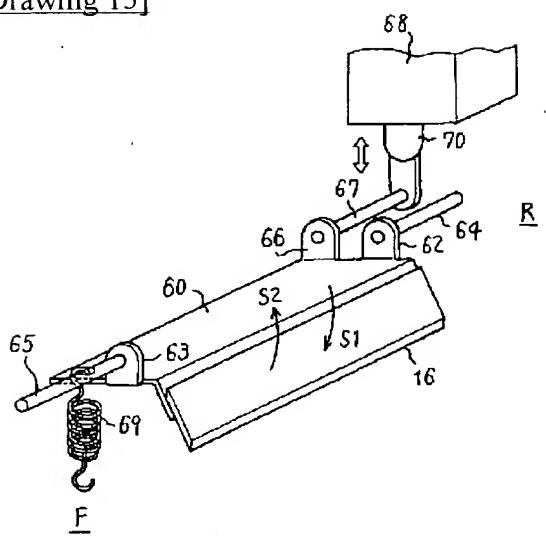
[Drawing 12]



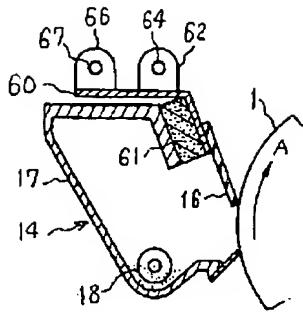
[Drawing 13]



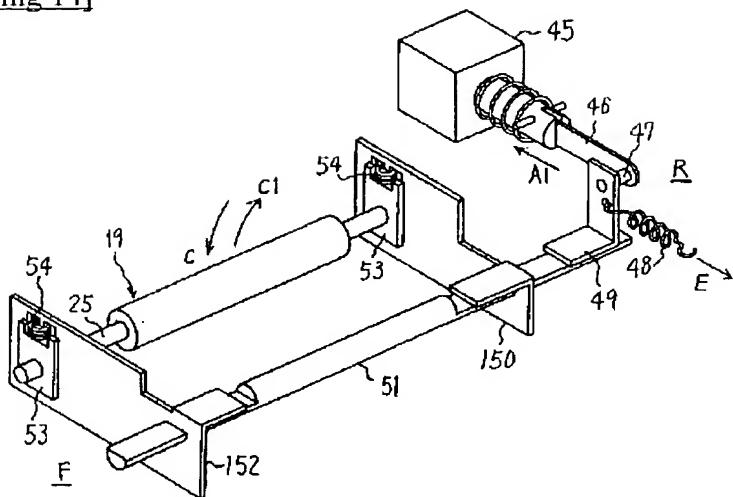
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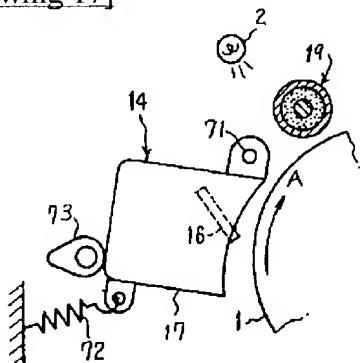
[Drawing 16]



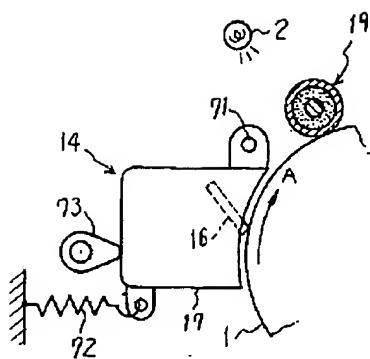
[Drawing 14]



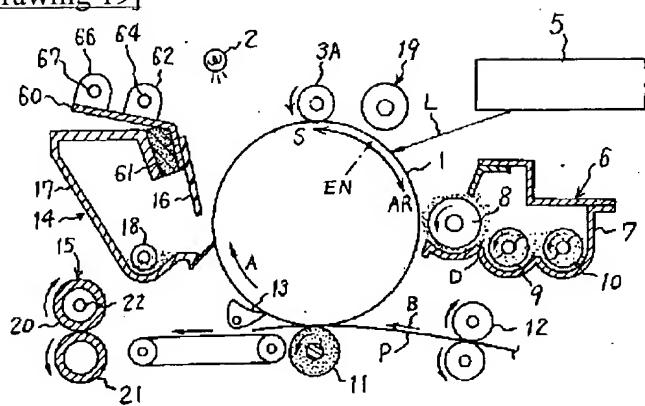
[Drawing 17]



[Drawing 18]



[Drawing 19]



[Translation done.]